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Claims

- Sub A27 1. A radio frequency tag identification system comprising a plurality of tags and a transceiver for sending information to and simultaneously receiving information from a plurality of tags without corruption, wherein each tag is allocated an identification word comprising a predetermined number of bits, the tags comprising means for selectively modulating a signal received from the transceiver, and the transceiver comprising means for sending an interrogation signal comprising a plurality of portions, wherein each portion is associated with a predetermined bit, or bit sequence, of the identification words and is used to simultaneously interrogate tags and simultaneously receive information from tags to identify, in response to modulated signals provided by the tags, the presence of a tag or tags having a given value at the bit or bit sequence.
- Sub A27 2. A system as claimed in claim 1, the transceiver further comprising, an antennae array, a radio frequency transponder, an external data communication port and an energizing source.
- Sub A27 3. A system as claimed in claim 2, the transceiver being capable of generating modulated radio frequency power for application to the antennae.
- Sub A3 4. A system as claimed in any one of the preceding claims, including in each tag an inductive loop antennae or capacitor plates that will convert the electric power into an electric field to communicate with transponders and provide the power for transponders where this power is not derived internally within the transponder from internal batteries or a light cell.
5. A system as claimed in any one of the preceding claims, including in each tag an antenna that will convert the signal power from the transceiver into an RF field to communicate with transponders.

6. A system as claimed in any one of the preceding claims, the transceiver including means for determining the nature of the modulation based on the logical outcome of previous communications with tags to conduct a binary search.

5 7. A system as claimed in any one of the preceding claims, the transceiver including means for detecting the modulation impressed on the field by any tag or plurality of tags in simultaneous communication, without corruption, comprising a demodulator and an amplifier, wherein the modulation signal is sent to a processor in a logic block and is digitized within a logic processor and evaluated.

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8. A system as claimed in any one of the preceding claims, the tag or tags comprising signal pickup means, a rectifier, a limiter with hysteresis, a clock extractor, a data extractor, a modulator and a logic section.

15 9. A system as claimed in claim 8, in which the signal pickup means comprises a pickup coil.

20 10. A method of detecting the presence of tags within a target area by sending interrogation signals from a transceiver for selective simultaneous modulation by active tags present in the target area, each tag being allocated an identification word comprising a predetermined number of bits, the method comprising:

25 sending from a transceiver an interrogation signal comprising a plurality of portions, each portion being associated with predetermined bit or bit sequence of the identification words and being capable of conveying a given value for the bit or sequence of bits, each portion being determined by the transceiver in dependence on the modulation response to the previous portion, wherein all tags in the field having the value at the predetermined bit or bit sequence are configured to simultaneously modulate the signal, the modulation being used to identify the presence of those tags.

24-05-2000

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11. A method as claimed in claim 10, wherein the presence of a tag or tags having an individual identification word is detected by sending an interrogation signal having portions and corresponding to all bits of the identification words.

5 12. A method as claimed in claim 10 or 11, using an adaptive interrogation signal wherein each portion comprises a first part which is used to simultaneously interrogate all active tags to determine whether the associated bit or sequence of bits has a first value, and a second part which is determined in dependence on the simultaneous response of the active tags in the field to interrogate the tags to determine whether the associated bit or
10 sequence of bits has a second value.

13. A method as claimed in claim 12, wherein if a portion is used to interrogate the tags to determine whether the associated bit or sequence of bits having the first value, the first part is sent, and if the portion is used to interrogate the tags to determine whether the
15 associated bit or sequence of bits has a second value, the first and second parts are sent.

14. A method as claimed in claim 10 to 13, wherein a tag not having the value at the predetermined bit or bit sequence ignores further signals until an activation or a wake signal is received.
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15. A method as claimed in any one of claims 10 to 14, wherein data bits of a tag transponder are read from and/or written to by sending further bits after the interrogation signal, wherein tag then deactivates and ignores further signals until an activation signal is received.
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16. A method whereby a tag can determine if the reader transceiver has received its attempted communication based on subsequent interrogation signals.

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